Waste and Materials Disposition

Frank Marcinowski
Deputy Assistant Secretary for
Logistics and Waste Disposition Enhancements

Environmental Management Advisory Board
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Outline of Presentation

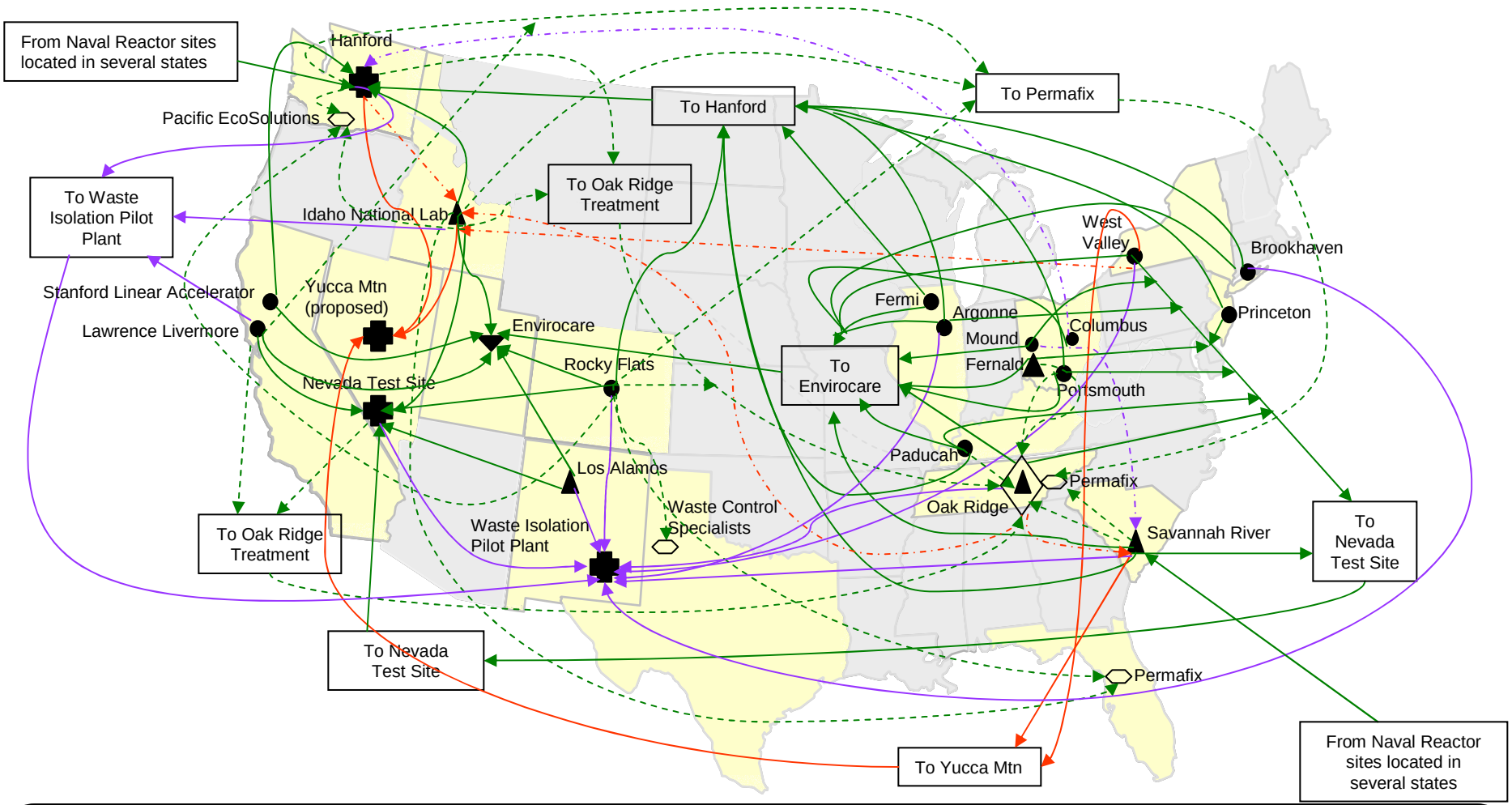
- Waste Disposition Overview
- Low-Level Waste (LLW) and Mixed LLW (MLLW)
  - Greater-Than-Class C (GTCC) LLW
- Transuranic (TRU) Waste
- High-Level Waste (HLW)/Spent Nuclear Fuel (SNF)

EM's Waste & Materials Disposition Activities

- Waste management and disposition activities comprise significant share of the Environmental Management (EM) program
- Developed/developing national disposition strategies and tools for major waste streams
  - To integrate, optimize, and accelerate
  - Collected new LLW/MLLW life cycle data, reevaluating guidance, updating disposition maps
  - Phase I included all EM funded waste projects (some non-EM projects reported)

Major DOE Radioactive Waste Transfers (includes commercial facilities)

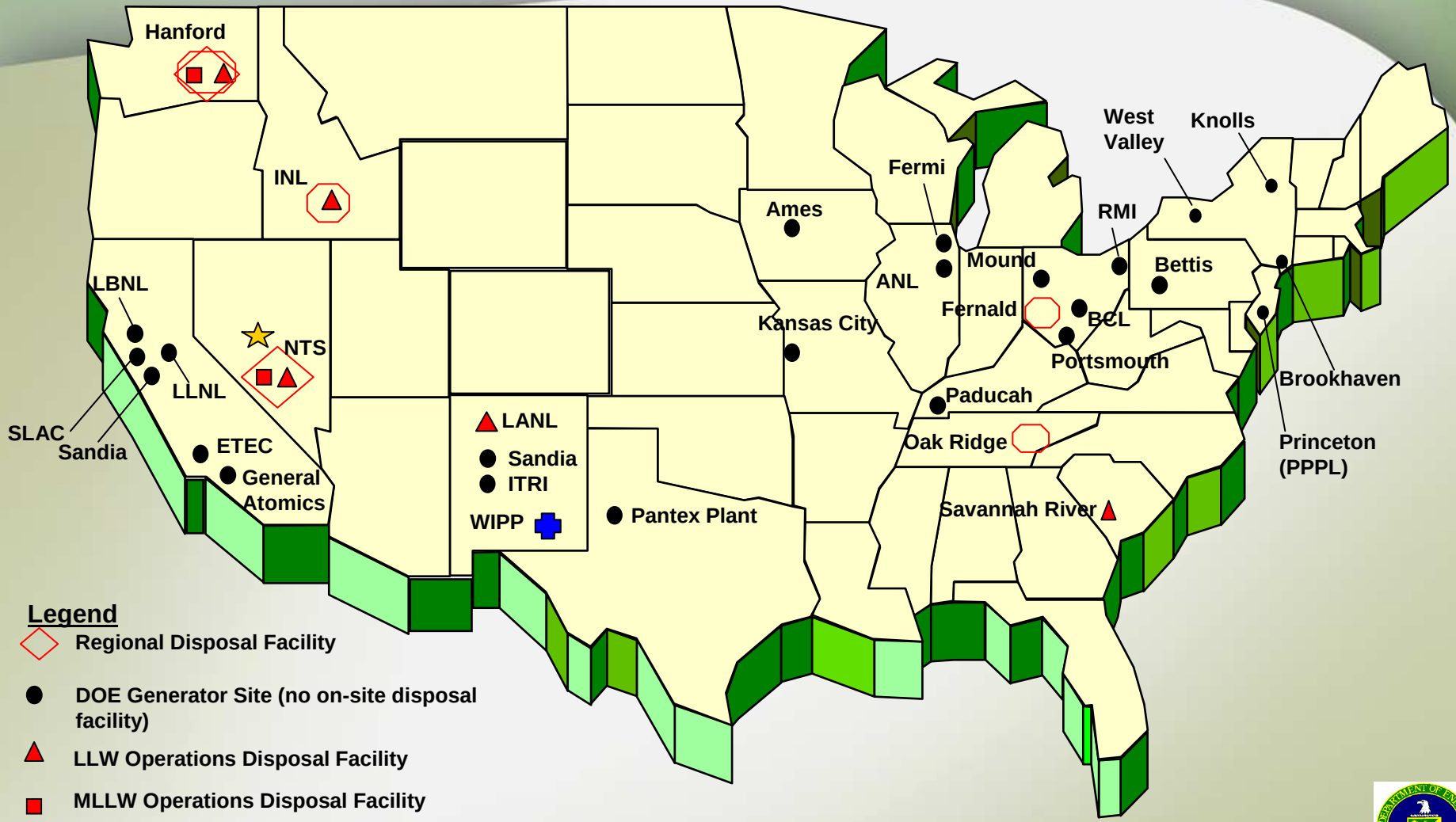
Shipment lines do not portray actual transportation routes. This map is not inclusive of all past or planned shipments.



DOE Order 435.1, "Radioactive Waste Management", Establishes Policy & Framework

- LLW/MLLW
  - If practical, disposal on the site at which it is generated
  - If on site disposal not available, at another DOE disposal facility
  - At commercial disposal facilities if compliant, cost effective, and in best interest of DOE
- TRU Waste
  - If defense, disposed at Waste Isolation Pilot Plant (WIPP), New Mexico
  - If defense determination pending, safe storage awaiting future disposition
- HLW and SNF
  - Stabilization, if necessary, and safe storage until geologic disposal is available

DOE's Waste Disposal Facility Configuration



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Building on Closure Success

EM's Waste Management Assets

- Two regional LLW disposal facilities – Hanford and NTS
- Two regional MLLW disposal facilities
  - Hanford currently limited to onsite MLLW
- Multiple onsite disposal cells (mostly CERCLA) for site-specific remediation wastes
- Geologic repository for defense TRU waste – WIPP (Carlsbad, NM)
- TSCA Incinerator (Oak Ridge, TN)
- However, EM also disposes of large volumes of LLW and MLLW at commercial facilities

DOE Relies on Commercial Treatment and Disposal Capabilities for LLW

- Three commercial LLW disposal facilities can accept certain DOE LLW:
  - EnergySolutions Clive Facility (formerly Envirocare of Utah)
  - Richland, WA, operated by U.S. Ecology on the Hanford Site (Northwest Compact)
  - Barnwell, SC, operated by Chem-Nuclear/Duratek (to become part of EnergySolutions) (Atlantic Compact)
- Some commercial processors include:
  - Perma-Fix
  - EnergySolutions
  - Waste Control Specialists LLC (WCS)
  - Duratek
  - PeCos
  - RACE

EM LLW Inventory Summary

Table LLW-1: LLW Inventories Managed by EM as of September 30, 2005[1]

Site	Volume (m^3)
Argonne National Laboratory	714
Battelle Columbus Decommissioning Project	10,300
Brookhaven National Laboratory	1
Energy Technology Engineering Center	18
Fernald Environmental Management Project[2]	37
Hanford Site	348
Idaho National Laboratory	2,460
Lawrence Livermore National Laboratory	502
Mound	42,000
Oak Ridge Reservation	8,350
Paducah Gaseous Diffusion Plant	81,700
Savannah River Site	165
West Valley Demonstration Project	13,300
Total	160,000

[1] Individual numbers and totals are rounded to a maximum of 3 significant digits.
[2] Does not include 11e.(2) byproduct material at Fernald.

- Most EM waste is generated from cleanup projects vs. ongoing operations
- Large inventories of "legacy" LLW at EM sites have nearly all been disposed – remaining large inventories to be reduced in 2006 or soon after
- Most existing LLW inventories result from decommissioning and site cleanup activities

Projected Volume of EM LLW/Material for Disposal 1/

Disposal Site	Volume (m^3) FY2006-2010	FY2006-2035
DOE Non-CERCLA Facilities		
• INL	27,900	27,900
• LANL (EM planned activities only 2/)	1,380	1,660
• Hanford Site	4,220	26,000
• NTS	157,000	269,000
• SRS	93,500	425,000
Subtotal	284,000	750,000
DOE CERCLA Facilities:		
• Fernald	188,000	188,000
• Hanford Site	1,060,000	1,800,000
• INL	48,300	59,700
• ORR	619,000	837,000
Subtotal	1,920,000	2,880,000
DOE Facilities Subtotal	2,200,000	3,630,000
Commercial Facilities	361,000	550,000
Facility to be determined	35,700	47,400
TOTAL LLW	2,600,000	4,230,000

1/ Individual numbers and totals are rounded to a maximum of 3 significant digits.
Does not include LLW shipped to commercial facilities for treatment to avoid double counting with disposal numbers.

2/ LANL disposal volumes are based on current EM activities only and may not represent actual disposal volumes since remedy decisions for most complex sites have not been made.

EM MLLW Inventory Summary

MLLW Inventories Managed by EM Program
(as of September 30, 2005) [1/]

Site	Volume (m^3)
ANL	34
Battelle	2
ETEC	2
FEMP	3,050
Hanford	7,440
INL	23,900
LLNL	250
ORR	3,320
Paducah	1,740
Rocky Flats (at WCS)	4,500
SRS	301
WVDP	122
TOTAL	44,700

1/ Individual numbers and totals are rounded to a maximum of 3 significant digits.

- Over past several years, large inventories of "legacy" MLLW at most EM sites have nearly all been disposed
- The majority of inventory is at INL with 10-100 nCi/g of transuranic radionuclides, which was historically managed as TRU waste

Projected Volume of MLLW to go Offsite for Treatment [1/]

Treatment Facility	Volume (m^3) FY2006-2010	FY2006-2035
TSCAI (ORR)	1,300	1,890
Commercial Facilities	2,050	18,600
Facility to be Determined	10,300	11,200
TOTAL	14,300	31,700

Projected Volume of MLLW/Material for Disposal [2/]

Disposal Site	Volume (m^3) FY2006-2010	FY2006-2035
DOE Non-CERCLA Facilities		
• Hanford	10,800	331,000
• NTS [3/]	11,300	12,100
Subtotal	22,100	343,000
DOE CERCLA Facilities		
• Hanford	4,070	4,070
• Idaho	86,300	181,000
• Oak Ridge	156,000	197,000
Subtotal	246,000	382,000
DOE Subtotal	268,000	725,000
Commercial Facilities	47,000	88,200
TOTAL	315,000	813,000

1/ Individual numbers and totals are rounded to a maximum of 3 significant digits. All waste with a to-be-determined disposition path is shown since it requires treatment prior to disposition.

2/ Individual numbers and totals are rounded to a maximum of 3 significant digits.

3/ NTS facility operates through the end of the first quarter of FY 2011.

LLW/MLLW Issues

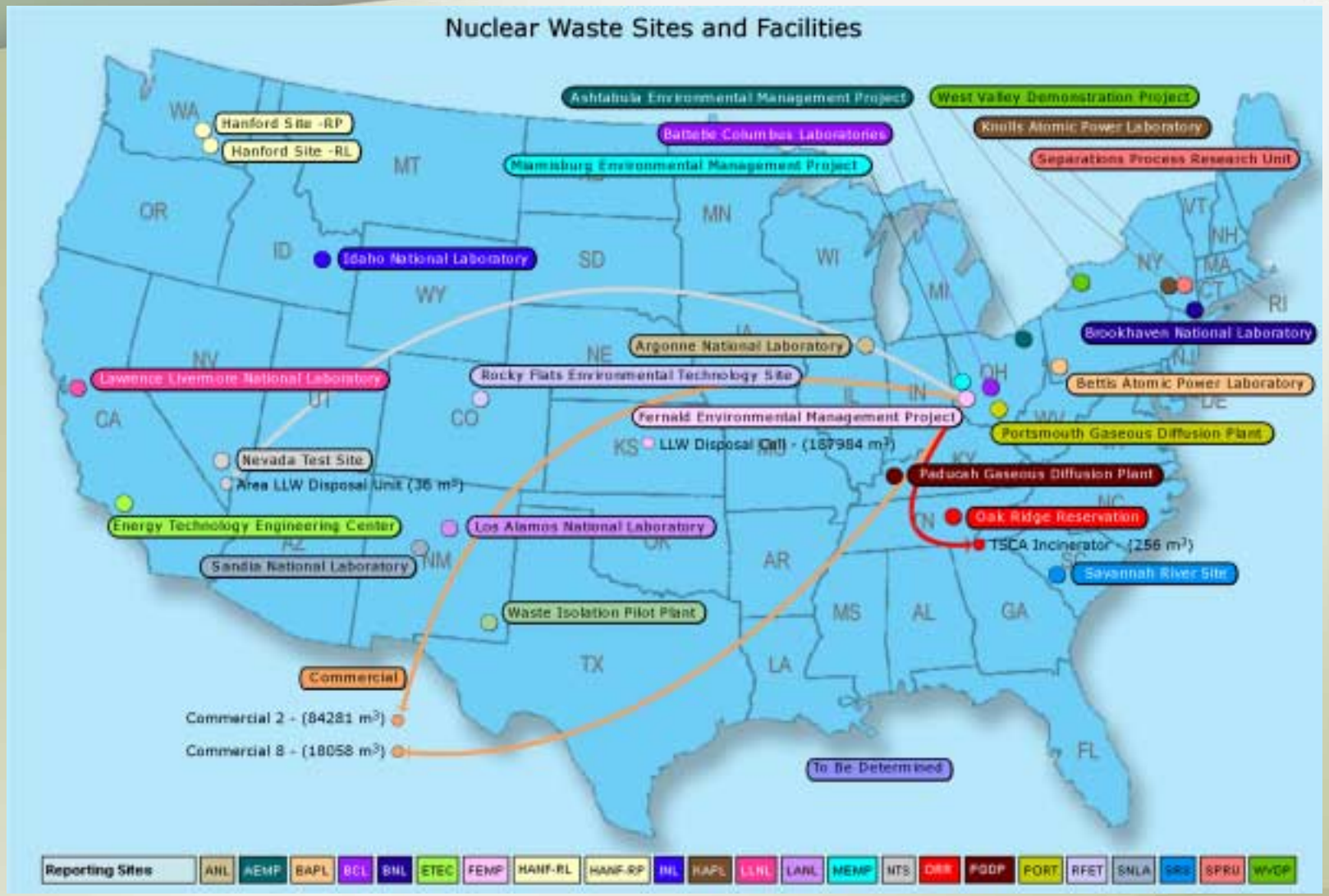
- Availability of DOE disposal facilities
  - Future disposal capacity for higher-activity MLLW
- Disposal capacity for Fernald Silo material
- Life-cycle cost analyses
- "TBD" wastes
- Continued operation of the TSCA Incinerator
- Constraints in treatment capacity

National Disposition Strategy

- Report prepared for Congress summarizing EM's "materials and disposition" efforts
- Draft LLW/MLLW National Disposition Strategy to be shared for public comment
  - LLW/MLLW strategy and disposition maps based on new life cycle waste forecasts (February 2006)
- New disposition maps produced by Florida International University's WIMS Internet tool
  - Generator, intermediate, receiver site – successor streams
  - Programmatic risk information

Disposition Map of Fernald Provides Example of New Tool

Disposition Map Can Also Be Drawn in Geographic Format



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Greater-Than-Class C LLW Disposition

- GTCC generally refers to commercially generated, NRC-licensed wastes -- wastes generated and managed by DOE
- Low-Level Radioactive Waste Policy Amendments Act assigned the Federal Government responsibility for disposal of GTCC
  - GTCC LLW disposal facility must be licensed by NRC
- In late 2004, EM became DOE organization responsible for this statutory requirement

Greater-Than-Class C LLW Disposition (Cont'd)

- EM published an Advance Notice of Intent to prepare an EIS on May 11, 2005
- DOE plans to issue a Notice of Intent (NOI) to prepare an EIS in 2006
- EIS expected to require about two years after NOI issuance
- Per Energy Policy Act of 2005, DOE must submit a report to Congress on the disposal alternatives and await Congressional action before selecting a final disposal decision
- DOE will also submit a report to Congress by August 8, 2006, on the estimated cost and schedule to prepare an EIS

DOE Continues to Optimize TRU Disposition

- WIPP is managed as a National program.
- Current efforts are focused on optimization:
  - In FY 1999, averaged 1.5 shipments/week
  - In FY 2006, averaging more than 20 shipments/week (33/wk record in February 2006!)
  - Filling pipeline (creating characterized backlog)
  - Fully utilizing capacity

- ~ 36,000 m^3 of contact-handled TRU waste disposed since March 1999.
- Over 4,400 truck shipments from eight sites completed.
- All shippable legacy TRU removed from 17 sites.

Final shipment departing RFETS

Information as of 2/21/06

Estimated Volume of TRU Waste for Disposal [1/]

Site Name	Contact-Handled (m^3)	Remote Handled (m^3)	Total [2/] (m^3)
ANL	79	119	199
Former ANL-W (now inINL)	44	93	137
Bettis Atomic Power Lab	19	2	21
Hanford Site	16,400	1,470	17,900
INL	69,100	219	69,300
Knolls-NFS (TN)	170	0	170
Knolls-NFS (NY)	0	135	135
LLNL	2,290	0	2,290
LANL	14,100	125	14,200
NTS	676	0	676
ORR	449	660	1,100
Paducah	11	0	11
SNL (NM)	23	5	28
SRS	7,980	69	8,050
Subtotal	111,000	2,900	114,000
Disposed at WIPP as of 2/27/06			35,947
Total Anticipated for Disposal			150,000

1/ Individual numbers and totals are rounded to a maximum of 3 significant digits.
2/ Total column reflects amount stored at sites as of 1/23/06 plus anticipated amounts.

TRU Waste Issues & Next Steps

- Continue to meet compliance milestones
- Pending permit modifications
  - Remote-handled/Section 311
- Optimizing waste shipment
  - Minimizing overpacks, load management
- Need for new shipping containers (TRUPACT-III)
- Leveraging corporate resources at Idaho and Oak Ridge